Econ 311: Behavioral and Experimental Economics

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More on Judgement and Belief Biases

Different Belief Biases

- Some belief biases are about things that are *external* to the decision-maker
  - We have already seen hot hand and gambler's fallacy
- Other beliefs biases are about things that are *internal* to the decision-maker
  - Projection bias: biased belief about your utility
  - Overconfidence: biased belief in your ability

Motivation: Breakups

- Asked of people in romantic relationships: *Imagine that you and the person you're involved with break up within the next week. Using a scale from 1 to 7, where 1 is not happy and 7 is very happy, how do you think you would feel on a typical day two months from now?*
- Asked of people with recent breakups: *Using a scale from 1 to 7, where 1 is not happy and 7 is very happy, how happy would you say you are these days, on a typical day?*
- Average responses:
  - Anticipating breakup: 3.9
  - Recent breakup: 5.4
- Any potential problems with this design?
  - Unincentivized responses; experimenter demand effect; self-image; framing differences; renormalization of happiness scale

Source: Gilbert, Pinel, Wilson Blumberg, and Wheatley (1998)

Interpretation

- People may be underestimating how adaptable their preferences are
- What other situations might have the same failure to predict your own resilience/adaptability?
  - Moving to a new state
  - Losing your job
  - Getting bad grade or performance review
  - Severe medical issue
  - Winning the lottery
- This failure to predict one's adaptability is a specific example of a more general bias:
  - *Projection bias*: the tendency to overestimate the degree to which future tastes will resemble current tastes

Shopping Lists

- Another manifestation of projection bias: current surroundings or state of mind have an undue impact on your planned consumption in the future
- Field experiment at grocery store
  - 135 people entering grocery store without a shopping list
  - Asked to fill out questionnaire with intended purchases
  - Some subjects chosen at random for "taste test" of a muffin (real purpose was to make some people less hungry)
  - After shopping, copies of receipts were collected
- Results: What was the percentage of items in shopping cart that were unplanned purchases?
  - Hungry shoppers: 51%
  - Sated shoppers: 34%
- Projection bias interpretation? Hungry people buy more because they think they will be more hungry in the future

Source: Gilbert, Gill, and Wilson (1998)

Planning Ahead

- In the previous experiment, it is possible that hungry people are buying more because they are going to consume it right away
- We can get around this with a design that separates the purchasing and the consumption
- Experiment with 200 office workers:
  - Workers asked to pick a snack to be delivered one week later
  - Snacks could be either healthy or unhealthy (not described as such to participants, of course)
  - Choices made right before or right after lunch
  - Snacks delivered right before or right after lunch
- Results: percent choosing unhealthy option:

	Consume before lunch	Consume after lunch
Choose before lunch	78%	42%
Choose after lunch	56%	26%

Source: Read and Van Leewen (1998)

Winter Clothes

- Projection bias seems to affect small purchases with tempting items like food, but will it affect purchases of more expensive, practical goods?
- Data from 2.2 million catalog purchases of cold-weather gear
  - Note this is *not* an experiment
  - Also in data set: temperature deviation on day item was ordered, relative to historical average temperature for that day
  - Standard theory: current temperature deviations should not affect purchasing behavior, since gear would not arrive for several days
- Results: orders for winter gear went up on colder-than-normal days
- Any alternate explanations?
  - Possible that colder weather increases salience, ie helps you remember to buy that coat you need
  - Counter-argument: items bought on colder-than-normal days are more likely to be returned

Source: Conlin, O'Donoghue, and Vogelsang (2005)

Theory Behind Projection Bias

- Individual has consumption c in state s
- Utility is $u(c|s)$, ie utility of consumption (pool or no pool) depends on state (good or bad weather)
- Consumer tries to make prediction in state s' about utility in future state s: $\bar{u}_{s'}(c|s)$
- Rational model: $\bar{u}_{s'}(c|s) = u(c|s)$
- Projection bias model: $\bar{u}_{s'}(c|s) = (1-\alpha)u(c|s) + \alpha u(c|s')$
- Variable α determines your deviation from standard model
- Note that projection bias *embeds* standard model when $\alpha = 0$

Motivation: Perceived Driving Ability

- College students asked to rate both their driving safety and driving skill relative to other people in experiment
- Even if people's estimate are noisy, the average self-ranking should be 50%
- Results:

Self rating:	Below 50%	50% to 80%	80 to 90%	above 90%
Safety	12.5%	27.5%	37.5%	22.5%
Skill	7.2%	46.4%	26.8%	19.5%

- What could cause these patterns?
  - Overconfidence
  - Don't want to admit weakness
  - Different conceptions of what skillful or safe driving means

Source: Svenson (1981)

Motivation: Entrepreneurs

- Relatively few new businesses are successful
  - More than 60% of manufacturing businesses close within 5 years
  - More than 80% of manufacturing businesses close within 10 years
  - Note: it is possible that this results from completely rational risk-reward decision
- Survey of 3000 new business owners were asked to asses the probability of their business succeeding:
  - 81% said their chances were 70% or better
  - One third said their business was certain to succeed

Source: Cooper, Wu, and Dunkelberg (1988)

What Might Cause Overconfidence?

- Consider the process of learning about one's ability from observing your own successes and failures
- Decision makers may ascribe too much credit to their success and explain failures as bad luck
  - This is a kind of *attribution bias*: failure to correctly attribute causes to their effects
  - This is also a *self-serving bias*: a bias that makes the decision-maker feel better about themselves
    - In turn assumes that ego enters the utility function
    - Also call this *ego defense*

Bounded Rationality

Defining Bounded Rationality

- *Bounded rationality* is the concept that people have cognitive or computational limits that prevent them from fully evaluating the consequences of their decisions
  - For example, when you decide what to buy for lunch, you are probably not looking at your bank account and the stock market to calculate your future expected income
- More likely you are using a *heuristic*
  - In the lunch example, maybe you just choose the best item that is under $10
- These heuristics are often helpful in simplifying a complex problem
- But as we saw in our discussion of judgement and beliefs, these heuristics lead to persistent biases

Narrow Framing

- People engage in *narrow framing* when they consider only a small set of options for a decision problem rather than optimizing globally
- Back to the lunch example:
  - Suppose there are two options on the menu: a chicken sandwich for price p_c and a steak sandwich for price p_s
  - You have amount m in your wallet
  - The narrow frame compares the "minimal" bundles: (chicken sandwich, $m - p_c$) vs (steak sandwich, $m - p_s$)
  - In theory the bundles are much "larger" than that: (chicken sandwich, $x_2, x_3, x_4, \ldots, x_{1000}$) vs (steak sandwich, $y_2, y_3, y_4, \ldots, y_{1000}$)
  - That is, you should consider how your choice of sandwich affects what you'll get for dinner, whether you'll watch a movie tonight, how much you'll save for retirement when you get a job, etc

Mental Accounting

- So how do we determine the size of the frame?
- One possibility: people divide certain purchase decisions into different *mental accounts* or mental budgets
  - Eg a separate budget for lunches, a separate budget for dinners, a separate budget for movies, and so on
  - Another possible type of accounting is temporal, eg daily or weekly budgets
  - Since money is fungible, these budgets are totally artificial
- We call the act of assigning a consumption decision to a certain mental account *booking*
  - Eg when you buy the steak sandwich, you *book it* to your lunch budget

Example: Lost Tickets

- Consider the following vignettes:
  - Problem A: Imagine that you have decided to see a play where admission is $10 per ticket. As you enter the theatre you discover that you have lost a $10 bill. Would you still pay $10 for a ticket to the play?
  - Problem B: Image that you have decided to see a play and paid the admission price of $10 per ticket. As you enter the theatre you discover that you have lost the ticket. The seat was not marked and the ticket cannot be recovered. Would you pay $10 for another ticket?
- How many people say yes to buying a ticket?
  - Problem A: 88%
  - Problem B: 56%

Source: Kahneman and Tversky (1981)

Mental Accounting Can Explain Tickets Vignettes

- Note that in either case you have to pay $10 to see the play, and your total wealth is the same
- In Problem A, the lost $10 does not get booked to the entertainment budget, for example
  - In this case, still have room in that budget to buy the ticket
- In Problem B, the originally purchased ticket may have maxed out to entertainment budget
  - In this case, no room in that budget to buy a second ticket

Example: Jacket and Calculator

- Consider the following two new vignettes:
  - Problem A: Imagine that you are about to purchase a jacket for \$125 and a calculator for \$15. The salesman informs you that the calculator you wish to buy is on sale for \$10 at the other branch of the store, located 20 minutes away. Would you make the trip to the other store?
  - Problem B: Imagine that you are about to purchase a jacket for \$15 and a calculator for \$125. The salesman informs you that the calculator you wish to buy is on sale for \$120 at the other branch of the store, located 20 minutes away. Would you make the trip to the other store?
- What percentage in each treatment say yes to driving to other store?
  - Problem A: 68%
  - Problem B: 29%
- Any problems with the design?

Source: Kahneman and Tversky (1981)

Jacket/Calculator Vignette: Explanations

- Note that in both versions, you have already decided to buy both items for total of $140, and will get discount of $5 on the bundle if you drive
- One possible explanation:
  - The calculator and jacket are in two different mental accounts: school supplies and clothes, for example
  - Evaluate the size of the discount within the narrow frame of the good being discounted
  - Discount is 33% for problem A and only 4% for problem B

Framing and Presentation Effects

- In the previous subsection, we used the word *framing* (in the context of narrow framing) to mean how the subject presented the information to herself
- There is another meaning for the word framing: how information is presented to the subject by an outside party (eg an experimenter or an advertiser)
  - Here, bounded rationality still plays a role, however
  - A different heuristic is used: the decision-maker looks for clues or shortcuts in the information provided
  - Can lead to bias when some of the information at hand is totally irrelevant

Poetry Workshop

- Ariely, Loewentstein, and Prelec (2006) run experiment to elicit student's willingness to pay to attend a poetry workshop
- Started by writing down the last digit of their social security number (call this digit n)
- If n is odd, asked "Would you attend the poetry reading for \$$n$?"
- If n is even, asked "Would you pay \$$n$ to attend the poetry reading?"
- Additionally, willingness to attend elicited for both groups in same way: price list from being paid \$10 to attend to paying \$10 to attend

Poetry Workshop: Results

Results of Experiment 3

Odd social security number digit (hypothetical question about being paid to attend) ($N=46$)	
Willing to attend for US$ = *Soc.Sec.No.* (%)	63
Would attend for free (%)	9
Mean valuation (st. error)	—US$ 4.46 (.51)
Even social security number digit (hypothetical question about paying to attend) ($N=35$)	
Willing to pay US$ = *Soc.Sec.No.* to attend (%)	20
Would attend for free (%)	49
Mean valuation (st. error)	—US$ 1.13 (.59)

- Both treatment groups require payment to attend on average
- But the odd group, which was asked initially if they would attend for payment, has a much more negative valuation
- Authors propose that these results are due to *coherent arbitrariness*
  - Value of an experience is determined somewhat arbitrarily (eg by looking SSN)
  - Once value is established, however, subsequent valuations are coherent with first

Source: Ariely, Loewentstein, and Prelec (2006)

Subjects Respond Coherently to Changes in Length of Experience

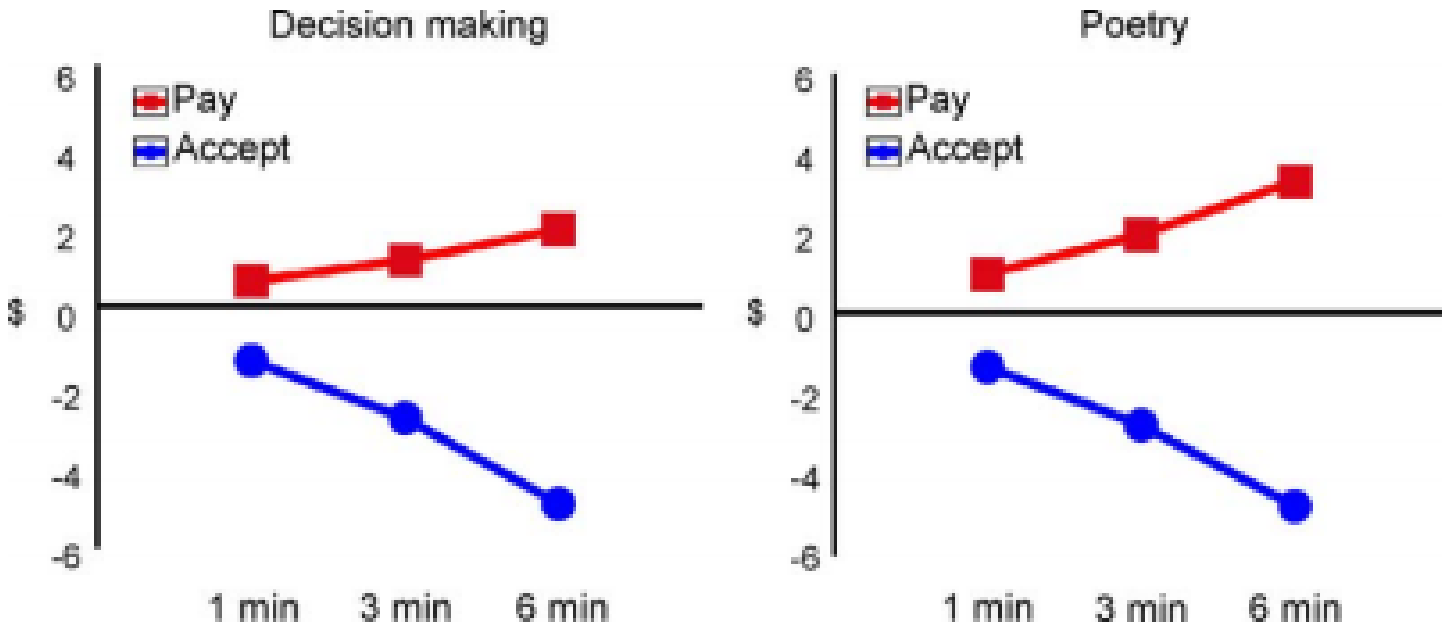


Fig. 1. *Experiment 2*: willingness to pay/accept money in US$ for different durations of poetry (right) and experiment participation (left) as a function of whether the hypothetical question was for paying (squares) or accepting payment (circles).

Source: Ariely, Loewentstein, and Prelec (2006)

Methodological Aside: Price Lists

- When trying to determine how much a participant values something, we often ask them a series of questions where we systematically vary the price:

  Would you pay \$9 to attend the poetry reading? Yes No
  Would you pay \$8 to attend the poetry reading? Yes No
  Would you pay \$7 to attend the poetry reading? Yes No
  etc . . .

- This is called a *price list*
- Note that subjects should switch from No to Yes at most once on this list
- Price lists are a specific example of the *strategy method*
  - Elicit decision (ie "strategy") from subject for many possible outcomes
  - Only one outcome will actually be implemented

Motivating Experiment

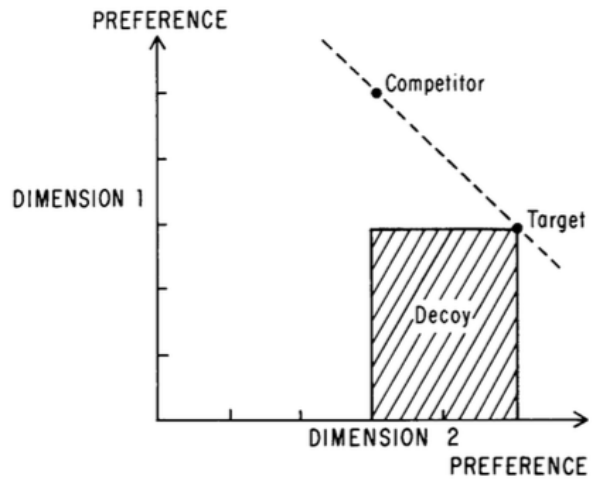
- In a lab experiment, 153 students were asked to make hypothetical choices between objects in several choice categories
  - Eg cars, TVs, restaurants
- Treatment variable: two or three options in choice set
- Two options: target and competitor, where neither clearly dominates the other
  - Eg, 35-inch TV for $400 or 27-inch TV for $300
- Three options: add a decoy option, which is dominated by target option
  - Eg, add 29-inch TV for $450 as third option
- Results:

	Target	Competitor	Decoy
Two options	51.5%	48.5%	–
Three options	65.3%	32.7%	2.0%

Source: Huber, Payne, and Puto (1982)

What is Going On Here?

- Classically, adding a third option should not make the purchase frequency of other options go *up*
- Authors propose a *decoy effect*
  - Participants have difficulty making comparison directly between target and competitor
  - However, can clearly see that target is better than decoy
  - Thus they presume that target is likely to be better deal overall



Source: Huber, Payne, and Puto (1982)

Decoy Effect in the Wild